

Exhibit A

**IN THE UNITED STATES DISTRICT COURT
FOR THE DISTRICT OF WYOMING**

STATE OF WYOMING and STATE OF MONTANA)	
)	
Petitioners,)	No. 16-cv-00285-SWS
)	
and)	[Consolidated with 16-cv-00280-SWS]
)	
STATE OF NORTH DAKOTA,)	
)	
Petitioner-Intervenor)	
)	
v.)	
)	
UNITED STATES DEPARTMENT OF THE INTERIOR, <i>et al.</i> ,)	
)	
Respondents.)	
)	
and)	
)	
WYOMING OUTDOOR COUNCIL, <i>et al.</i>)	
)	
Respondent-Intervenors.)	
)	
)	

DECLARATION OF TIMOTHY R. SPISAK

I, Timothy R. Spisak, declare as follows:

1. I am employed as the Senior Advisor – Conventional Energy in the Energy, Minerals & Realty Management Directorate of the Bureau of Land Management (BLM) in Washington, D.C. The directorate provides policy development and oversight to the BLM’s minerals programs and its realty programs. I have a total of 32 years of government service with the United States Bureau of Mines and the BLM. Over my

career I have served as a Petroleum Engineer, a Supervisory Petroleum Engineer, a Program Analysis Officer, and an Administrative Officer. I was the Field Office Manager for the BLM's Field Office in Amarillo, Texas, for five years. I was the Fluid Minerals Division Chief in BLM's Washington Office for five years. I served as the Deputy Assistant Director, Energy, Minerals & Realty Management for five years, and have held my current position for three years. I hold a Bachelor of Science degree in Petroleum and Natural Gas Engineering from the Pennsylvania State University (1983) and a Master of Business Administration degree from West Texas A&M University (1994).

2. I was actively involved in the development of the BLM's proposed Waste Prevention Rule (81 Fed. Reg. 6616), which was issued on February 8, 2016. The BLM accepted comments from the public on the proposed rule from February 8, 2016, until April 22, 2016. During this period, I led public comment hearings on the proposed rule in Farmington, New Mexico, Oklahoma City, Oklahoma, Denver, Colorado, and Dickinson, North Dakota. The BLM received approximately 330,000 public comments on the proposed rule, including approximately 1,000 unique comments. After the close of the comment period, I led the team of BLM personnel who reviewed the public comments, held meetings with stakeholders, and revised the proposed rule. The BLM's final Waste Prevention Rule (81 Fed. Reg. 83008) ("the Rule") was issued by the BLM on November 18, 2016, and is the result of a careful and professional rulemaking process involving thousands of hours of work on the part of the BLM. I have personal knowledge of the facts set forth in this declaration and, if called as a witness, I could testify competently to those facts.

The Rule is in the Public Interest

3. The BLM's Waste Prevention Rule ("the Rule") aims to reduce the waste of natural gas from mineral leases administered by the BLM. This gas is lost during oil and gas production activities through venting or flaring of gas, and through equipment leaks. The Rule provides a needed update to the BLM's rules governing the waste of natural gas through venting and flaring, which have not been updated in over 30 years.

The Importance of BLM's Oil and Gas Leasing Program

4. Congress has directed the Secretary of the Interior, who has in turn directed the Bureau of Land Management, to oversee the development of Federal and Indian oil and gas resources under multiple laws, including the Mineral Leasing Act of 1920, the Mineral Leasing Act for Acquired Lands of 1947, the Federal Oil and Gas Royalty Management Act, the Federal Land Policy and Management Act of 1976, the Indian Mineral Leasing Act of 1938, the Indian Mineral Development Act of 1982, and the Act of March 3, 1909.
5. The BLM's onshore oil and gas management program is a major contributor to our nation's oil and gas production. The BLM manages more than 245 million acres of land and 700 million acres of subsurface estate, making up nearly a third of the nation's mineral estate. Domestic production from over 96,000 Federal onshore oil and gas wells accounts for 11 percent of the nation's natural gas supply and 5 percent of its oil supply. The Office of Natural Resources Revenue (ONRR) has reported that in FY 2015 operators produced 183.4 million barrels (bbl) of oil, 2.6 trillion cubic feet (Tcf) of natural gas, and 3.3 billion gallons of natural gas liquids (NGL) from onshore Federal and Indian oil and gas leases. The production value of this oil and gas exceeded \$20.9 billion and generated over \$2.3 billion in royalties.

Issues Addressed by this Rule

Large Quantities of Natural Gas Are Wasted from Federal and Indian Leases

6. Over the past decade, the United States has experienced a dramatic increase in oil and natural gas production due to technological advances, such as hydraulic fracturing combined with directional drilling. At the same time, the American public has not benefitted from the full potential of this increased production, as the increase in oil production has been accompanied by significant and growing quantities of wasted natural gas. Natural gas is a limited and valuable public resource, which is critical to U.S. energy security. Natural gas also provides significant economic benefits as an energy source for electricity generation, home heating, and other industrial and residential uses. In addition, the waste of natural gas from BLM-administered leases results in lost royalty payments to the States, Tribes, and the United States.
7. During the development of the Rule, ONRR provided the BLM with data reported by operators on the Oil and Gas Operations Reports -- Part B (OGOR-B) reporting form quantifying vented and flared volumes over a 7 year period. The data included gas flared and vented from both oil and gas wells from 2009 through 2015. During this period, operators reported that they vented or flared a total of 462 billion cubic feet (Bcf) of natural gas, or about 2.7 percent of the 16.8 Tcf of natural gas that was produced from BLM-administered leases. This is enough natural gas to supply over 6.2 million households—or every household in the states of Colorado, Montana, New Mexico, North Dakota, South Dakota, Utah, and Wyoming—for 1 year.
8. Available data suggest that the problem of natural gas loss on BLM-administered leases is growing. In 2015, operators vented or flared at least 85 Bcf, a 114 percent increase

from 2009 levels. Flaring of oil-well gas increased by 318 percent from 2009 through 2015.

9. The quantities of vented and flared gas reported by operators on the OGOR-B typically do not include additional quantities of gas lost through venting from equipment and leaks. The BLM estimates that about 4.01 Bcf of natural gas was lost in 2014 as a result of leaks or other fugitive emissions from various oil and gas components, including valves, fittings, pumps, storage vessels, and compressors on BLM-administered leases. This quantity of gas would supply nearly 55,000 homes for a year.

Improved Understanding of Venting and Leaks Sources of Waste

10. Recent academic and government studies supported by industry and environmental organizations indicate that more natural gas is lost through leaks and unreported venting than previously understood. For example, some studies suggest leakage rates are two to three times higher than EPA's prior estimates.
11. A recent study conducted by scientists from the National Oceanic and Atmospheric Administrations (NOAA) and the Cooperative Institute for Research in Environmental Sciences at the University of Colorado, Boulder, found that methane emissions from fossil fuel production are 20% to 60% greater than previously believed.
12. In 2015, a team of scientists at Colorado State University published studies based on direct measurements of emissions from 114 gathering facilities at sixteen different processing plants. The study found that 30 percent of the facilities were responsible for approximately 80 percent of the venting and leaks. Approximately 20 percent of the facilities had emissions rates four times the overall average of remaining facilities. The

study found that these high-emitting facilities could immediately reduce their emissions through operating adjustments.

13. A July 2016 study by the Colorado Air Pollution Control Division surveyed oil and gas wells over two years using optical gas imaging. The research revealed a significant number of leaks, but also highlighted that timely identification and repair of leaks immediately reduces waste from production facilities.

Safety Concerns

14. The flaring of gas that cannot be captured is, except in certain limited circumstances, important for ensuring the safety of individuals engaged in oil and gas production. Uncontrolled releases of methane at oil and gas production sites create risks of explosions and hypoxia – risks that would be avoided were the methane flared. The BLM has long recognized the safety risks associated with venting and has typically required the flaring of gas that cannot be captured and sold or used on site.¹

Existing BLM Regulations Need to be Updated

15. Venting, flaring, and royalty-free use of gas on BLM-administered leases are currently governed by Notice to Lessees and Operators of Onshore Federal and Indian Oil and Gas Leases, Royalty or Compensation for Oil and Gas Lost (NTL-4A), which was issued in 1979. Except under defined situations, such as emergencies and production tests, NTL-4A prohibits the venting or flaring of gas-well gas and limits the venting or flaring of oil-well gas, unless an application to vent or flare the oil-well gas is approved by the BLM. NTL-4A also specifies the circumstances under which an operator owes royalties on oil or gas that is lost from a lease.

¹ See Exhibit A, United States Geological Survey, Conservation Division Manual 644.5.3.G(4).

16. Over the last few years, there has been a marked increase in the number of applications to BLM from operators to vent or flare royalty-free. In 2005, the BLM received just 50 applications to vent or flare gas. In 2011, the BLM received 622 applications, and this number doubled within 3 years to 1,248 applications in 2014.
17. In addition, in the 37 years since NTL-4A was issued, oil and gas production technologies and practices have advanced considerably, particularly with the development of hydraulic fracturing techniques combined with directional drilling. Technologies for capturing and using gas on-site, detecting leaks, powering equipment using produced gas, controlling vapors from storage vessels, removing liquids from gas wells, and many other aspects of the production process have also advanced.
18. NTL-4A does not reflect today's best practices and advanced technologies, and it is not effective in minimizing waste of public minerals, as evidenced by the substantial losses of natural gas through venting, flaring, and leaks from BLM-administered leases, and the increasing number of applications to vent or flare royalty-free. In addition, ambiguities in NTL-4A have resulted in different interpretations and implementation practices by various BLM field offices and industry entities. There is therefore a compelling need to update NTL-4A's requirements to make them clearer and more effective, to reflect modern technologies and practices, and to support more uniform application of the BLM's waste-minimization requirements.

Concerns Identified Through Oversight

19. External oversight reviews strongly support the BLM's conclusions that the NTL-4A requirements need to be updated.

20. For example, in October 2010, the Government Accountability Office (GAO) issued a report entitled *Federal Oil and Gas Leases—Opportunities Exist to Capture Vented and Flared Gas, Which Would Increase Royalty Payments and Reduce Greenhouse Gas Emissions*. The GAO examined the amounts of natural gas being vented and flared on Federal oil and gas leases and evaluated the potential for additional capture using available technologies. The GAO concluded that around 40 percent of the natural gas estimated to be vented or flared from onshore Federal leases could be economically captured with currently available control technologies. The GAO further found that DOI's existing efforts to minimize these natural gas losses were insufficient, noting the fact that DOI regulations and guidance did not address new capture technologies and some significant sources of lost gas. The GAO recommended that the BLM revise its requirements to make clear that newer capture technologies should be used, where economical, to reduce venting and flaring losses.
21. The GAO report also found that data reported to ONRR on lost gas from BLM-administered leases likely underestimated the volumes because some sources of lost gas were not reported. The GAO recommended that the BLM take steps to ensure a complete and accurate accounting of vented and flared gas.

Impacts of the Rule

Expected Reductions in Waste of Natural Gas

22. The BLM estimates that the Rule's gas capture requirement, which requires operators to capture a specified, annually increasing percentage of the gas produced from their development oil wells, will reduce the quantity of flared gas by roughly 26 percent in

2020, relative to 2015 levels, and by almost 50 percent in 2025, again relative to 2015 levels.

23. The BLM estimates that the Rule's leak detection and repair (LDAR) requirements will increase natural gas production from BLM-administered leases by 5.2 Bcf per year.

Impact on Production and Royalties

24. The BLM expects the Rule to have only a small influence on the levels of production of natural gas, NGLs, and crude oil from onshore Federal and Indian oil and gas leases. Specifically, the BLM expects an increase in natural gas production ranging from 9 to 41 Bcf per year (representing 0.03 to 0.15 percent of the total U.S. production), as operators increase their gas capture. The BLM expects a potential reduction in crude oil production ranging from 0.0 to 3.2 million bbl per year (representing 0 to 0.07 percent of the total U.S. production), due to some potential for limited curtailment of oil production, should operators choose that method to reduce gas losses.
25. The BLM estimates that the Rule will result in additional royalty payments of \$3 to 10 million a year. Over the 10-year period from 2017 to 2026, the BLM estimates additional royalties of \$65 million (net present value using a 7% discount rate) or \$82 million (net present value using a 3% discount rate).
26. My analysis of flaring data reported to ONRR indicates that, assuming 2015 levels of flaring, only about 8% of operators would be impacted by section 3179.7's most stringent gas capture requirement (98% capture percentage, 750 Mcf/month/well flaring allowable), which does not go into effect until January 1, 2026.

Net Benefits

27. Overall, the BLM estimates that the monetized benefits of the Rule outweigh its costs by a significant margin. The BLM estimates that the Rule will have net benefits over the period from 2017 to 2026 of \$46 – 199 million per year (with capital costs annualized using a 7% discount rate) and \$50 – 204 million per year (with capital costs annualized using a 3% discount rate).
28. The BLM's net benefits calculations factor in the estimated benefits to operators of selling the captured gas, and the estimated benefits to society of avoiding the associated methane emissions. To calculate the latter benefits, the BLM applied the U.S. government's estimates of the social cost of methane, which are presented in the Addendum to Technical Support Document on Social Cost of Carbon for Regulatory Impact Analysis under Executive Order 12866.
29. The BLM found that the rule would have additional non-monetized benefits including improved quality of life for residents living near oil and gas operations from reduced noise and light pollution from flares, reduced release of VOCs, including benzene and other hazardous air pollutants, and reduced production of nitrogen oxides and particulate matter.

BLM Coordinated Closely with EPA During the Development of the Rule

30. In developing this Rule, the BLM considered EPA's air pollution regulations limiting methane emissions from oil and gas production equipment, because measures to limit waste by reducing venting, flaring, and leaks necessarily also reduce methane emissions.
31. Most provisions of the BLM Rule have no analogous EPA provision. Moreover, the EPA requirements do not apply to oil and gas operations pre-dating the EPA regulations.

32. For the few provisions where there is a similar EPA requirement applicable to new and modified sources, the BLM acted to ensure that the BLM's Rule complements and does not conflict with EPA's regulations. First, the BLM worked to align the Rule's requirements as much as possible with EPA's requirements. Second, the BLM Rule allows operators to comply with similar EPA requirements in lieu of the Rule's requirements. To achieve this, BLM coordinated closely with EPA during the development of the Rule.
33. Specifically, BLM discussed the Rule with personnel from EPA on more than 40 conference calls over the period from January 2015 to October 2016.
34. In addition, the EPA provided comments on both the BLM's proposed rule and the final rule, and the BLM reviewed and commented on EPA's proposed and final rules published in September 2015 and June 2016, during the interagency review processes coordinated by the Office of Information and Regulatory Affairs within the Office of Management and Budget. The BLM addressed the EPA's comments in finalizing the Rule.

Regulations Governing BLM's Handling of Confidential Business Information

35. The Rule's requirement that operators submit a waste minimization plan with their applications for permits to drill (APD), as well as the various opportunities for operators to apply for variances and exemptions through the submission of Sundry Notices, could result in operators submitting confidential business information (CBI) to the BLM.
36. It is not unusual for the BLM to receive CBI from operators and the BLM takes care to avoid the disclosure of CBI. In fact, DOI has regulations – found at 43 CFR Part 2,

Subpart F – governing the handling of confidential information. In addition, the BLM is careful to comply with the Trade Secrets Act when handling CBI.

Declaration

37. I declare that the foregoing is true and correct.

Executed on December 14, 2016



Timothy R. Spisak

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Transmittal Sheet

Onshore Oil and Gas Program Series

Release No. 68

June 23, 1980

This release, CDM 644.5, provides guidelines and procedures for implementing the requirements of NTL-4A; it defines the circumstances under which the flaring or venting of gas from, or for the benefit of, onshore Federal and Indian oil and gas leases will be authorized.

George F. Brown

Chief, Conservation Division

FILING INSTRUCTIONS:

Remove:

Insert:

None

CDM 644.5 (pages 1 -19)

Replaces:

None

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Onshore Oil and Gas Program Series

Part 644 - Producing Operations

Chapter 5 - Waste Prevention/Beneficial Use

644.5.1

.1 Purpose and Objective.

This chapter provides guidelines for ensuring that all operations conducted on, or for the benefit of, Federal and Indian onshore oil and gas leases result in: (1) beneficial use of leasehold production, and (2) maximum ultimate recovery of oil and gas, with minimum waste or damage to hydrocarbons or other resources. This chapter also contains specific guidelines and procedures for approving the flaring or venting of gas.

A Notice to Lessees and Operators (NTL-4A) summarizing the requirements in this chapter is shown in Exhibit 1.

.2 Authority.

A. Mineral Leasing Act of 1920, as Amended (30 U.S.C. 181 et seq.)

- (1) Section 16. ". . . All leases of lands containing oil or gas. . . shall be subject to the condition that the lessee will . . . use all reasonable precautions to prevent waste of oil or gas. . . ."
- (2) Section 30. ". . . Each lease shall contain provisions for. . .insuring the exercise of reasonable diligence, skill, and care in the operation of said property. . .for the prevention of undue waste. . . ."

B. Mineral Leasing Act for Acquired Lands of August 7, 1947 (30 U.S.C. 351 et seq.)

- (1) Section 10. "The Secretary. . .is authorized to prescribe such rules and regulations as are necessary. . .to carry out the purpose of this Act, which rules and regulations shall be the same as those prescribed under the mineral leasing laws. . . ."

C. 30 CFR 221 (7 F.R. 4132, June 2, 1942)

- (1) 221.2(n) Waste of oil or gas. "Waste of oil or gas, in addition to its ordinary meaning, shall mean the physical waste of oil or gas, and waste, or dissipation of reservoir energy existent in any deposit containing oil or gas and necessary or useful in obtaining the maximum recovery from such deposit.

"(1) Physical waste of oil or gas shall be deemed to include the loss or destruction of oil or gas after recovery thereof such as to prevent proper utilization and beneficial use

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thereof, and the loss of oil or gas prior to recovery thereof by isolation or entrapment, by migration, by premature release of natural gas from solution in oil, or in any other manner such as to render impracticable the recovery of such oil or gas.

"(2) Waste of reservoir energy shall be deemed to include the failure reasonably to maintain such energy by artificial means and also the dissipation of gas energy, hydrostatic energy, or other natural reservoir energy, at any time at a rate or in a manner which would constitute improvident use of the energy available or result in loss thereof without reasonably adequate recovery of oil."

- (2) 221.35 Waste prevention; beneficial use. "The lessee is obligated to prevent the waste of oil or gas and to avoid physical waste of gas the lessee shall consume it beneficially or market it or return it to the productive formation. If waste of gas occurs the lessee shall pay the lessor the full value of all gas wasted by blowing, release, escape, or otherwise at a price not less than 5 cents for each 1,000 cubic feet, unless, on application by the lessee, such waste of gas under the particular circumstances involved shall be determined by the Secretary to be sanctioned by the laws of the United States and of the state in which it occurs. The production of oil and gas shall be restricted to such amount as can be put to beneficial use with adequate realization of values, and in order to avoid excessive production of either oil or gas, when required by the Secretary, shall be limited by the market demand for gas or by the market demand for oil."

- D. Standard Public Domain and Acquired Oil and Gas Lease Forms contain language similar to the following:

"To exercise reasonable diligence in drilling and producing the wells herein. . .to carry on all operations in accordance with approved methods and practice as provided in the Oil and Gas Operating Regulations, having due regard for the prevention of waste of oil or gas or damage to deposits or formations containing oil, gas, or water, . . .or other mineral deposits, for conservation of gas energy, for the preservation and conservation of the property for future productive operations. . . ."

- E. Standard Tribal and Allotted Indian Oil and Gas Lease Forms and the regulations in Title 25 CFR generally provide that the lessee shall "exercise reasonable diligence in drilling and operating

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wells for oil and gas on the lands covered hereby, while such products can be secured in paying quantities; to carry on all operations hereunder in a good and workmanlike manner in accordance with approved methods and practice, having due regard for the prevention of waste of oil or gas developed on the land...."

- F. 25 CFR 171.19 Diligence and prevention of waste. (22 F.R. 10588, December 24, 1957)

"The lessee shall exercise diligence in drilling and operating wells for oil and gas on the leased lands while such products can be secured in paying quantities; carry on all operations in a good and workmanlike manner in accordance with approved methods and practice, having due regard for the prevention of waste of oil or gas developed on the land...."

- G. 25 CFR 172.24 Operation and development regulations. (22 F.R. 10592, December 24, 1957)

"Lessees will be required to carry out and observe the operating regulations now or hereafter in force governing oil and gas operations on restricted Indian lands...."

.3 Guidelines and Policy.

A. General.

In accordance with the regulations and the terms of the various oil and gas leases issued pursuant to the Mineral Leasing Act of 1920 (30 U.S.C. 181-287), the Mineral Leasing Act for Acquired Lands (30 U.S.C. 351-359), the implied authority of the Executive Branch as defined in the Attorney General's Opinion of April 2, 1941, the Allotted Land Leasing Act of March 3, 1909 (25 U.S.C. 396), and the Unallotted Indian Leasing Act of May 11, 1938 (25 U.S.C. 396a), the lessee of a Federal or Indian oil and gas lease is obligated to avoid physical waste of gas, and the Area Oil and Gas Supervisor (Supervisor) is responsible for assuring that such waste is avoided.

All gas produced from, or for the benefit of, Federal and Indian oil and gas leases may be flared or vented only in accordance with the requirements of this chapter and NTL-4A. Any other flaring or venting is considered waste. Accordingly, the term waste, as used in this chapter, implies a preventable loss, and the criteria to determine whether an occurrence constitutes waste are whether it is unnecessary, avoidable, excessive, or unreasonable. Mere physical loss is not necessarily waste.

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Oil production subject to royalty or other compensation includes that which (1) is produced and sold on a lease basis or for the benefit of a lease under the terms of an approved communitization or unitization agreement and (2) the Supervisor determines to have been avoidably lost on a lease, communitized tract, or unitized area. No royalty obligation accrues on oil which (1) is used on the same lease, same communitized tract, or same unitized participating area for beneficial purposes or (2) the Supervisor determines to have been unavoidably lost.

Gas production (both gas-well gas and oil-well gas) subject to royalty or other compensation includes that which is produced and sold on a lease basis or for the benefit of a lease under the terms of an approved communitization or unitization agreement. No royalty obligation accrues on any produced gas which (1) is used on the same lease, same communitized tract, or same unitized participating area for beneficial purposes, (2) is vented or flared with the Supervisor's prior authorization or approval during drilling, completing, or producing operations, (3) is vented or flared pursuant to the rules, regulations, or orders of the appropriate State regulatory agency when said rules, regulations, or orders have been ratified or accepted by Supervisor, or (4) the Supervisor determines to have been otherwise unavoidably lost.

Where produced gas (both gas-well gas and oil-well gas) is (1) vented or flared during drilling, completing, or producing operations without the prior authorization, approval, ratification, or acceptance of the Supervisor or (2) otherwise avoidably lost, as determined by the Supervisor, the compensation due the United States or the Indian lessor will be computed on the basis of the full value of the gas so wasted, or the allocated portion thereof, attributable to the lease.

B. Definitions.

- (1) "Avoidably lost" production means the venting or flaring of produced gas without the prior authorization, approval, ratification, or acceptance of the Supervisor and the loss of produced oil or gas when the Supervisor determines that such loss occurred as a result of (1) negligence on the part of the lessee or operator, or (2) the failure of the lessee or operator to take all reasonable measures to prevent and/or to control the loss, or (3) the failure of the lessee or operator to comply fully with the applicable lease terms and regulations, appropriate provisions of the approved operating plan, or the prior written orders of the Supervisor, or (4) any combination of the foregoing.

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- (2) "Beneficial purposes" means oil or gas which is produced from a lease, communitized tract, or unitized participating area and which is used on or for the benefit of that same lease, same communitized tract, or same unitized participating area for operating or producing purposes such as (1) fuel in lifting oil or gas, (2) fuel in the heating of oil or gas for the purpose of placing it in a merchantable condition, (3) fuel in compressing gas for the purpose of placing it in a marketable condition, or (4) fuel for firing steam generators for the enhanced recovery of oil.

Gas used for beneficial purposes shall also include that which is produced from a lease, communitized tract, or unitized participating area and which is consumed on or for the benefit of that same lease, same communitized tract, or same unitized participating area (1) as fuel for drilling rig engines, (2) as the source of actuating automatic valves at production facilities, or (3) (with the prior approval of the Supervisor) as the circulation medium during drilling operations.

Where the produced gas is processed through a gasoline plant and royalty settlement is based on the residue gas and other products at the tailgate of the plant, the gas consumed as fuel in the plant operations will be considered as being utilized for beneficial purposes. In addition, gas which is produced from a lease, communitized tract, or unitized participating area and which, in accordance with a plan approved by the Supervisor, is reinjected into wells or formations subject to that same lease, same communitized tract, or same unitized participating area for the purpose of increasing ultimate recovery will be considered as being used for beneficial purposes; however, royalty will be charged on the gas used for this purpose at the time it is finally produced and sold.

- (3) "Unavoidably lost" production means (1) gas vapors which are released from storage tanks or other low-pressure production vessels, unless the Supervisor determines that the recovery of such vapors would be warranted, (2) oil or gas which is lost because of line failures, equipment malfunctions, blowouts, fires, or otherwise, except where the Supervisor determines that the loss resulted from negligence or failure of the lessee or operator to take all reasonable measures to prevent and/or control the loss, and (3) the venting or flaring of gas in accordance with Section III of NTL-4A.

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C. Small Volume or Short-term Venting and Flaring.

Oil- or gas-well gas may be vented or flared on a short-term basis without incurring a royalty obligation only in the following circumstances.

- (1) **Emergencies.** During temporary emergency situations, such as compressor or other equipment failures, relief of abnormal system pressures, or other conditions which result in the unavoidable short-term venting or flaring of gas. However, this authorization to vent or flare gas in such circumstances without incurring a royalty obligation is limited to 24 hours per incident and to 144 hours cumulative for the lease during any calendar month, except with the prior authorization, approval, ratification, or acceptance of the Supervisor.
- (2) **Well Purging and Evaluation Tests.** While unloading or cleaning up a well during drillstem, producing, routine purging, or evaluation tests, not exceeding a period of 24 hours.
- (3) **Initial Production Tests.** During initial well evaluation tests, not exceeding a period of 30 days or the production of 50 MMcf of gas, whichever occurs first, unless a longer test period has been authorized by the appropriate State regulatory agency and ratified or accepted by the Supervisor.
- (4) **Routine or Special Well Tests.** During routine or special well tests, other than those cited above, only after approval by the Supervisor.

D. Gas-well Gas.

Except as provided in paragraph .3C above, gas-well gas may not be flared or vented. Any venting or flaring not in accordance with these guidelines will be considered avoidable.

For purposes of this release, a gas well is defined as one in which the energy equivalent of the gaseous component (gas and entrained liquids) produced exceeds the energy equivalent of the liquid component (crude oil) produced. Each producing situation must be considered separately, but the energy equivalent of the two phases will normally be equal, at a gas-oil ratio of about 5300.

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E. Oil-well Gas.

Except as provided in paragraph .3C above, oil-well gas may not be flared or vented unless approved in writing by the Supervisor. The Supervisor may approve an application for flaring or venting of oil-well gas if the operator has submitted an evaluation supported by engineering, economic, and geologic data indicating that: (1) the expenditures necessary to market or beneficially use the gas are not economically justified, i.e. would result in an unreasonable payout period; or (2) conservation of the gas will result in an earlier abandonment and ultimate greater loss of equivalent energy than would be recovered for beneficial use, if flaring or venting were allowed; or (3) the operator has initiated positive action which will eliminate flaring or venting within one year. Any venting or flaring not in accordance with these guidelines will normally be considered avoidable.

Upon completion of the well and prior to the conclusion of the initial test period, the lessee/operator will be requested to submit plans for conserving the gas or sufficient justification for flaring. If the operator's response does not meet these conditions, the well should be shut in or its production restricted (and the gas flared will be considered wasteful).

F. Applications for Flaring or Venting.

Applications for venting or flaring oil-well gas must include all appropriate engineering, geologic, and economic data in support of the applicant's determination that conservation of the gas is not economically viable and, if approval is not granted to continue the venting or flaring of the gas, that it will result in the premature abandonment of oil production and/or the curtailment of lease development. This information must include the applicant's estimates of the volumes of oil and gas that would be produced to the economic limit if the application to vent or flare were approved and the volumes of the oil and gas that would be produced if the applicant was required to market or beneficially use the gas.

From an economic basis, all leasehold production must be considered; the major concern is profitable operation of the lease, not just the profitable disposition of the gas. However, the gas portion should not burden the overall profitability of the lease operation to the extent that it is no longer a reasonable investment because of an excessive payout term. Therefore, if the lessee contends that reserves of casinghead gas are inadequate to support the installation of facilities for gas collection and

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sale, this contention must be justified by submittal of: (1) an economic reserve estimate, (2) a cost estimate for the facilities necessary to market or otherwise conserve the gas, and (3) estimates of operating income with and without gas conservation.

Many times, it may be uneconomical for an individual lease to put casinghead gas to beneficial use. However, economics of conserving gas must be on a field-wide basis, and the Supervisor must consider the feasibility of a joint operation between all other lessees/operators in the field or area. Even in cases where it is uneconomical to build a pipeline to market the casinghead gas, the well should be considered for being shut in or production restricted when the value of the gas flared exceeds the value of the oil produced. When production is restricted rather than shut in, the restricted rate should not exceed 10 MMcf/well/month or 50 MMcf/field/month. If gas volumes from the initial well(s) are insufficient to support a pipeline connection, operations can likewise be shut in or restricted, until additional engineering data or drilling either develops sufficient reserves or confirms the absence of additional gas. The Supervisor should periodically reassess leases/fields which have approved flaring, as additional development occurs or economic conditions improve.

There are two economic criteria for approving applications for flaring gas: (1) absence of a reasonable payout, considering both oil and gas production; and (2) the required gas facilities would pose an excessive burden on total lease operation. Guidelines for evaluating applications are contained in Exhibit 2.

When it is justified by the lessee/operator, temporary flaring of gas production not exceeding one year may be allowed while evaluating reserves, awaiting pipeline construction, negotiating sales contracts, or awaiting plant construction, provided total monthly per-well gas flared does not exceed 10 MMcf. The fact that a lessee/operator is not financially able to properly dispose of all production from the leasehold is not automatic justification for allowing loss of nonrenewable resources.

G. Other Measures.

Other items to be considered include:

- (1) Requiring collection and conservation of stock tank vapors where such vapors can be collected economically, even though the payout period may be longer than desired by the operator.

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- (2) Requiring recovery and conservation of natural gas liquids, even when pipeline connections are not feasible and gas must be flared.
- (3) Requiring reinjection of the gas to the producing formation where reservoir conditions are such that the injection of gas will not result in decreased ultimate recovery; (Requiring injection of the gas into a different horizon under a gas storage agreement should also be considered.)
- (4) Requiring that all venting or flaring of gas conform with State or Federal air quality standards for emissions, which ever are more stringent, and with State regulations for gas waste and flaring. Because of safety requirements, gas which cannot be beneficially used or sold must normally be flared, not vented.
- (5) Oil and gas lost during a blowout would be considered as unavoidably lost unless the blowout resulted from noncompliance with the regulations or approved APD.
- (6) Gas flared while drilling underbalanced may be considered as unavoidably lost.
- (7) Shutting in producing oil or gas wells to conserve gas constitutes a suspension of production, but not of operations. Therefore, applications for a suspension of operations in accordance with Section 39 of the Mineral Leasing Act (30 U.S.C. 209) should not be approved. Wells shut in for conservation purposes may still be counted as producing for royalty purposes under 30 CFR 221.49.

H. Non-Federal Lands.

When flaring or venting occurs within areas which involve both Federal and non-Federal lands, the Supervisor will contact the appropriate State agency to attempt to jointly effect optimum gas conservation. If such cooperative effort is not possible, the Supervisor will proceed unilaterally to take action to prevent unnecessary venting or flaring from Federal lands. Where substantial waste is occurring, its prevention is more important than possible drainage which may occur during the period of downtime. CDM 641.2 presents guidelines on drainage determinations, and CDM 645.1, 645.2, and 645.3 discuss operations on non-Federal lands in approved unit or communitization agreements.

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I. Enforcement Provisions.

In all cases, the Supervisor will determine whether a specific instance or occurrence is unnecessary, excessive, or unreasonable, to an extent that constitutes waste. The burden of proof rests with the lessee/operator to justify that his practices are not wasteful. If the Supervisor determines that the small volumes involved are not economically feasible to conserve or recover, and waste is not occurring, no further action need be taken unless future developments, such as extension of gathering facilities or the development of additional reserves, warrant a re-evaluation. However, if the Supervisor determines that waste is occurring, immediate steps shall be taken to conserve the gas by shutting in or restricting all operations on Federal land that are contributing to the waste. If such operations are restricted rather than shut in, the lessee/operator shall be charged full value for the wasted gas until waste ceases. The purpose of charging full value on wasted gas is to encourage the conservation of these important resources by increasing the incentive to do so.

When Indian lands are involved, the Area Supervisor shall advise the appropriate Bureau of Indian Affairs (BIA) office that gas production must be conserved. The Supervisor must inform the BIA office of the existing circumstances and what the effect of shutting-in or restricting production would be in terms of lost royalty revenue for the gas, reduced royalty revenue for the oil, and the possibility of drainage. The Supervisor should, on his own authority, assess full value for gas he determines was wasted but should not take shut-in or production restriction actions until BIA concurs.

J. Effective Date.

The venting or flaring of gas from oil wells completed prior to January 1, 1980, is authorized to continue for an interim period. However, an application for approval to continue such practices must be submitted within 90 days (i.e. by March 31, 1980) unless such venting or flaring was previously authorized, approved, ratified, or accepted in writing by the Supervisor.

For oil wells completed on or after January 1, 1980, an application must be filed with the Supervisor, and approval received, for any venting or flaring of gas beyond the initial 30-day or other authorized test period.

K. Payment for Gas Lost.

Royalty is due for that gas subject to payment at the time it is flared or vented. Where the loss is determined to be avoidable,

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or where it occurred without the approval of the Supervisor, the payment will be based on the full value of the gas lost. Guidelines and procedures on payment for oil and gas lost are contained in CDM 647.18.

The volume of oil or gas produced, whether sold, avoidably or unavoidably lost, vented or flared, or used for beneficial purposes (including gas that is reinjected) must be reported on Form 9-329, Monthly Report of Operation, in accordance with the requirement of NTL-4A and the applicable provisions of NTL-1 and NTL-1A. The volume and value of all oil and gas which is sold, vented or flared without the authorization, approval, ratification or acceptance of the Supervisor, or which is otherwise determined by the Supervisor to be avoidably lost, must be reported on Form 9-361, Monthly Report of Sales and Royalties. Payments submitted in this respect must be accompanied by a Form 9-614-A, Rental and Royalty Remittance Advice.

No decision on approval of applications to flare under NTL-4A will affect previous determinations on flaring and payments made under NTL-4. This means a decision that flaring is currently unavoidable would not be applied retroactively to affect a previous decision that unauthorized flaring was wasteful.

Exhibit 3 summarizes the payment requirements for oil and gas production.

.4 Responsibility and Procedures.

A. District Supervisor/Engineer.

In general, the District Supervisor/Engineer is responsible for: approving the drilling of new wells with appropriate stipulations concerning test periods and gas venting/flaring; reviewing new well completions to assure compliance with NTL-4A; reviewing operator's applications for flaring oil-well gas and providing recommendations to the Area Supervisor; assuring, during field inspections, that gas venting/flaring is in accordance with NTL-4A; reviewing all approved flaring on a periodic basis to determine if changing conditions warrant conservation of the gas; monitoring all cases where conservation was required to determine if deadlines or other requirements were met; and taking interim action to stop avoidable or unauthorized gas flaring, and reporting such instances to the Area Supervisor.

B. Area Supervisor.

In general, the Area Supervisor is responsible for: routing a copy of all applications for venting/flaring to Districts for

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review; approving operators' applications for venting/flaring; reviewing the procedures used by the Districts in implementing NTL-4A; reviewing reports and recommendations submitted by the Districts; taking final action on all instances of unauthorized venting/flaring; consulting with appropriate State agencies where cooperative efforts are required; and establishing product values and determining whether losses are avoidable or unavoidable.

C. Area Accountant.

In general, the Area Accountant is responsible for ensuring that all required payments and Forms 9-361 and 9-329 are received.

.5 Background and Reference.

- A. Memorandum from Supervisor, Southern Rocky Mountain Region, dated March 9, 1972, to Chief, Branch of Oil and Gas Operations, reviewing regulations and instructions concerning gas flaring.
- B. Report by J. B. Mitchell summarizing Survey policies concerning gas waste (March 14, 1939).
- C. Memorandum from Assistant Solicitor Minerals, dated May 30, 1974, regarding royalty on flared and vented gas and spilled oil on leases issued under the Mineral Leasing Act.
- D. Memorandum from Chief, Conservation Division, dated July 12, 1974, directing that lessee/operators be notified that royalty will be due on all flared and vented gas and spilled oil from Federal oil and gas leases after July 1, 1974.
- E. From U.S. Department of Energy, Monthly Energy Review: average barrel of crude oil contains 5.8×10^6 Btu's; average cubic foot wet natural gas contains 1095 Btu's; energy equivalent 5.8×10^6 divided by 1095 = 5297, or a gas-oil ratio of about 5300.
- F. Memorandum from Solicitor, dated January 10, 1979, regarding revocation of NTL-4.

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Geological Survey**Royalty or Compensation for Oil and Gas Lost; Revocation of Certain Provisions Contained in Notices to Lessees and Operators (NTL-4)**

Notice is hereby given that certain provisions of Notice to Lessees and Operators (NTL-4) and the supplements thereto have been revoked and will be superseded by Notice to Lessees and Operators, NTL-4A. Copies of NTL-4A, approved effective January 1, 1980, will be distributed by the Area Oil and Gas Supervisors shortly to the lessees and operators of onshore Federal and Indian oil and gas leases under the jurisdiction of the Geological Survey.

The revocation of certain provisions of NTL-4 and its supersession by NTL-4A is necessary to accord with court decisions and the related instructions provided to the Geological Survey by the Office of the Solicitor, Department of the Interior.

The provisions of NTL-4 superseded by this action are revoked retroactive to December 1, 1974, the effective date of said Notice. Lessees and operators who submitted royalty payments under the revoked provisions of NTL-4 may apply for a refund of those payments. The addendum attached to NTL-4A specifies the requirements for these applications and the methods by which refunds will be approved and processed.

The approved Notice to Lessees and Operators (NTL-4A), is as follows:

Notice to Lessees and Operators of Onshore Federal and Indian Oil and Gas Leases (NTL-4A)**Royalty or Compensation for Oil and Gas Lost**

This Notice is issued pursuant to the authority prescribed in the Oil and Gas Operating Regulations, Title 30 CFR 221, and in accordance with the terms of the Federal and Indian oil and gas leases under the jurisdiction of the Geological Survey. This Notice supersedes certain provisions of NTL-4, issued effective December 1, 1974; Supplement No. 1 to NTL-4, issued effective December 1, 1978, to 10 lessees and operators on a nationwide basis; and Supplement No. 1 to NTL-4, issued effective December 1, 1978, to all lessees and operators in Wyoming. Lessees and operators who submitted payments for royalty on oil and gas lost under those provisions of NTL-4, which are hereby revoked, may file with the Area Oil and Gas Supervisor (Supervisor) an application for a refund of those payments in accordance with the addendum attached to this Notice.

I. General

Oil production subject to royalty shall include that which (1) is produced and sold on a lease basis or for the benefit of a lease under the terms of an approved communitization or unitization agreement and (2) the Supervisor determines to have been avoidably lost on a lease, communitized tract, or unitized area. No royalty obligation shall accrue as to that produced oil which (1) is used on the same lease, same communitized tract, or same unitized participating area for beneficial purposes or (2) the Supervisor determines to have been unavoidably lost.

Gas production (both gas well gas and oil well gas) subject to royalty shall include that which is produced and sold on a lease basis or for the benefit of a lease under the terms of an approved communitization or unitization agreement. No royalty obligation shall accrue on any produced gas which (1) is used on the same lease, same communitized tract, or same unitized participating area for beneficial purposes, (2) is vented or flared with the Supervisor's prior authorization or approval during drilling, completing, or producing operations, (3) is vented or flared pursuant to the rules, regulations, or orders of the appropriate State regulatory agency when said rules, regulations, or orders have been ratified or accepted by the Supervisor, or (4) the Supervisor determines to have been otherwise unavoidably lost.

Where produced gas (both gas well gas and oil well gas) is (1) vented or flared during drilling, completing, or producing operations without the prior authorization, approval, ratification, or acceptance of the Supervisor or (2) otherwise avoidably lost, as determined by the Supervisor, the compensation due the United States or the Indian lessor will be computed on the basis of the full value of the gas so wasted, or the allocated portion thereof, attributable to the lease.

II. Definitions

As used in this Notice, certain terms are defined as follows:

A. "Avoidably lost" production shall mean the venting or flaring of produced gas without the prior authorization, approval, ratification, or acceptance of the Supervisor and the loss of produced oil or gas when the Supervisor determines that such loss occurred as a result of (1) negligence on the part of the lessee or operator; or (2) the failure of the lessee or operator to take all reasonable measures to prevent and/or to control the loss, or (3) the failure of the lessee or operator to comply fully with the applicable lease terms and regulations, appropriate provisions of the approved operating plan, or the prior written orders of the Supervisor, or (4) any combination of the foregoing.

B. "Beneficial purposes" shall mean that oil or gas which is produced from a lease, communitized tract, or unitized participating area and which is used on or for the benefit of that same lease, same communitized tract,

or same unitized participating area for operating or producing purposes such as (1) fuel in lifting oil or gas, (2) fuel in the heating of oil or gas for the purpose of placing it in a merchantable condition, (3) fuel in compressing gas for the purpose of placing it in a marketable condition, or (4) fuel for firing steam generators for the enhanced recovery of oil. Gas used for beneficial purpose shall also include that which is produced from a lease, communitized tract, or unitized participating area and which is consumed on or for the benefit of that same lease, same communitized tract, or same unitized participating area (1) as fuel for drilling rig engines, (2) as the source of actuating automatic valves at production facilities, or (3) with the prior approval of the Supervisor, as the circulation medium during drilling operations. Where the produced gas is processed through a gasoline plant and royalty settlement is based on the residue gas and other products at the tailgate of the plant, the gas consumed as fuel in the plant operations will be considered as being utilized for beneficial purposes. In addition, gas which is produced from a lease, communitized tract, or unitized participating area and which, in accordance with a plan approved by the Supervisor, is reinjected into wells or formations subject to that same lease, same communitized tract, or same unitized participating area for the purpose of increasing ultimate recovery shall be considered as being used for beneficial purposes; provided, however, that royalty will be charged on the gas used for this purpose at the time it is finally produced and sold.

C. "Unavoidably lost" production shall mean (1) those gas vapors which are released from storage tanks or other low-pressure production vessels unless the Supervisor determines that the recovery of such vapors would be warranted, (2) that oil or gas which is lost because of line failures, equipment malfunctions, blowouts, fires, or otherwise except where the Supervisor determines that said loss resulted from the negligence or the failure of the lessee or operator to take all reasonable measures to prevent and/or control the loss, and (3) the venting or flaring of gas in accordance with Section III hereof.

III. Authorized Venting and Flaring of Gas

Lessees or operators are hereby authorized to vent or flare gas on a short-term basis without incurring a royalty obligation in the following circumstances:

A. **Emergencies.** During temporary emergency situations, such as compressor or other equipment failures, relief of abnormal system pressures, or other conditions which result in the unavoidable short-term venting or flaring of gas. However, this authorization to vent or flare gas in such circumstances without incurring a royalty obligation is limited to 24 hours per incident and to 144 hours cumulative for the lease during any calendar month, except with the prior authorization, approval, ratification, or acceptance of the Supervisor.

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B. Well Purging and Evaluation Tests. During the unloading or cleaning up of a well during drillstem, producing, routine purging, or evaluation tests, not exceeding a period of 24 hours.

C. Initial Production Tests. During initial well evaluation tests, not exceeding a period of 30 days or the production of 50 MMcf of gas, whichever occurs first, unless a longer test period has been authorized by the appropriate State regulatory agency and ratified or accepted by the Supervisor.

D. Routine or Special Well Tests. During routine or special well tests, other than those cited in III.B and C above, only after approval by the Supervisor.

IV. Other Venting or Flaring

A. Gas Well Gas. Except as provided in II. C and III above, gas well gas may not be flared or vented. For the purposes of this Notice, a gas well will be construed as a well from which the energy equivalent of the gas produced, including its entrained liquid hydrocarbons, exceeds the energy equivalent of the oil produced.

B. Oil Well Gas. Except as provided in II.C and III above, oil well gas may not be vented or flared unless approved in writing by the Supervisor. The Supervisor may approve an application for the venting or flaring of oil well gas if justified either by the submittal of (1) an evaluation report supported by engineering, geologic, and economic data which demonstrates to the satisfaction of the Supervisor that the expenditures necessary to market or beneficially use such gas are not economically justified and that conservation of the gas, if required, would lead to the premature abandonment of recoverable oil reserves and ultimately to a greater loss of equivalent energy than would be recovered if the venting or flaring were permitted to continue or (2) an action plan that will eliminate venting or flaring of the gas within 1 year from the date of application.

The venting or flaring of gas from oil wells completed prior to the effective date of this Notice is authorized for an interim period. However, an application for approval to continue such practices must be submitted within 90 days from the effective date hereof, unless such venting or flaring of gas was authorized, approved, ratified, or accepted previously by the Supervisor. For oil wells completed on or after the effective date of this Notice, an application must be filed with the Supervisor, and approval received, for any venting or flaring of gas beyond the initial 30-day or other authorized test period.

C. Content of Applications. Applications under section B above shall include all appropriate engineering, geologic, and economic data in support of the applicant's determination that conservation of the gas is not viable from an economic standpoint and, if approval is not granted to continue the venting or flaring of the gas, that it will result in the premature abandonment of oil production and/or the curtailment of lease development. The information provided shall include the applicant's estimates of the volumes of oil and gas that would be

approved and the volumes of the oil and gas that would be produced to the economic limit if the application to vent or flare were produced if the applicant was required to market or beneficially use the gas. When evaluating the feasibility of requiring conservation of the gas, the total leasehold production, including both oil and gas, as well as the economics of a fieldwide plan shall be considered by the Supervisor in determining whether the lease can be operated successfully if it is required that the gas be conserved.

V. Reporting and Measurement Responsibilities

The volume of oil or gas produced, whether sold, unavoidably or unavoidably lost, vented or flared, or used for beneficial purposes (including gas that is reinjected) must be reported on Form 9-329, Monthly Report of Operation, in accordance with the requirement of this Notice and the applicable provisions of NTL-1 and NTL-1A. The volume and value of all oil and gas which is sold, vented or flared without the authorization, approval, ratification, or acceptance of the Supervisor, or which is otherwise determined by the Supervisor to be avoidably lost must be reported on Form 9-361, Monthly Report of Sales and Royalties. Payments submitted in this respect must be accompanied by a Form 9-614-A, Rental and Royalty Remittance Advice.

In determining the volumes of oil and gas to be reported in accordance with the first and second paragraphs of this Section V, lessees and operators shall adhere to the following:

1. When the amount of oil or gas involved has been measured in accordance with Title 30 CFR 221.43 or 221.44, that measurement shall be the basis for the volume reported.
2. When the amount of oil and gas avoidably or unavoidably lost, vented or flared, or used for beneficial purposes occurs without measurement, the volume of oil or gas shall be determined utilizing the following criteria, as applicable:
 - a. Last measured throughput of the production facility.
 - b. Duration of the period of time in which no measurement was made.
 - c. Daily lease production rates.
 - d. Historic production data.
 - e. Well production rates and gas-oil ratio tests.
 - f. Productive capability of other wells in the area completed in the same formation.
 - g. Subsequent measurement or testing, as required by the Supervisor.
 - h. Such other methods as may be approved by the Supervisor.

The Supervisor may require the installation of additional measurement equipment whenever it is determined that the present methods are inadequate to meet the purposes of this Notice.

Don E. Kash,

Chief, Conservation Division, Geological Survey.

(FR Doc. 78-39400 12-26-78 8:48 am)

BILLING CODE 4310-31-41

VI. Value Determinations for Royalty or Compensation Purposes

In computing the royalty or compensation due on oil or gas under the provisions of this Notice, the value shall be computed in the same manner as the Supervisor would have calculated the value of the oil or gas had it been sold from the same lease, same communitized tract, or same unitized participating area.

VII. Compliance

The failure to comply with the requirements of this Notice will result in compliance being secured by such actions as are provided by law and regulation.

Addendum to NTL-4A

Refund Applications

Certain provisions of NTL-4 have been revoked retroactive to December 1, 1974, the effective date of said Notice. Accordingly, lessees and operators who submitted royalty payments under the provisions of NTL-4 may apply for a refund of those payments made for (1) oil that was unavoidably lost or used for beneficial purposes on the lease, communitized tract, or unitized participating area from which it was produced and/or (2) gas that was vented or flared with the prior approval of the Supervisor or unavoidably lost. No refunds will be processed in the absence of such an application, and no refunds will be made of those payments submitted on the basis of a determination of waste by the Supervisor. In addition, liquidated damages assessed for the late filing of reports or the failure to report pursuant to the provisions of NTL-4 will not be refunded.

The application shall be in the form of a letter signed by an authorized officer or agent of the lessee or operator and for each individual lease shall include:

1. The lease prefix code and lease number.
2. The month and year.
3. The product code (01, 02, 03, 04, 41, or 43) used in the reports and payments previously submitted to the Supervisor.
4. The volume of lost oil and/or gas previously reported and the amount of the refund requested.
5. The total amount of the refund requested for each lease as a subtotal.
6. The total amount of the refund requested for all leases as a grand total.

Additional instructions in regard to the filing and contents of said applications may be obtained by contacting the Supervisor having jurisdiction over the lease or leases involved.

Refund applications will be processed as promptly as possible. The Supervisor, as to Federal leases, may process a direct refund or authorize the applicant to withhold the refund amount from future royalty accruals. However, refunds authorized by the Supervisor with respect to Indian leases will be recoverable only as a credit against future rental or royalty accruals in accordance with the provisions of Section IX (Overpayments) of NTL-1A.

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Guidelines for Evaluating Applications for Flaring

Upon application, flaring or venting of oil-well gas will be allowed when the operator has submitted an evaluation, with appropriate supporting data, showing that rejection of the request for flaring will result in an early abandonment and ultimate greater loss of equivalent total energy (i.e. Btu) than could be recovered for beneficial use from the lease if flaring or venting were allowed, or the investment required to conserve the gas is not economically feasible. Accordingly, an economic analysis must be made for each application for flaring or venting. Although the format of the evaluation may vary depending upon the circumstances of each case, the following will generally be required for each applicant:

- (1) Estimate the life of the lease and the annual net operating income from oil recovery operations (and initial capital investment, where appropriate);
- (2) Estimate capital investment and annual net operating income from gas recovery operations; then
- (3) Using mid-year lump-sum deferment factors (from Republic National Bank of Dallas tables or equivalent), calculate the present value of operating net income for both oil and gas operations. Unless a different rate is justified by the operator, the discount factor used must be 12 percent;
- (4) Based on the present value of net income from: (1) oil operations, (2) gas operations, and (3) combined operations, calculate the payout periods for each.
- (5) Criteria for requiring gas conservation:
 - (a) New field:
 - (i) Combined payout exceeds the payout of the oil operation by less than 25%, but not beyond 5 years, (i.e., if payout of oil operation is estimated to be 12 months, the combined operation must pay out within 15 months); and
 - (ii) Payout from gas-only operation is less than 5 years; and
 - (iii) The estimated life of the field/lease is greater than the longest pay out period calculated; then, gas conservation is required.
 - (b) Old field (payout of original investment achieved):
 - (i) If combination of all net income from existing oil operation and gas operation will provide a payout of capital investment for gas facilities within 6 months; and

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(ii) Payout from gas operation is less than 5 years; and

(iii) The estimated life of the field is greater than 5 years; then, gas conservation is required.

Generally, in situations requiring longer payout periods, approval to flare may be granted. In marginal cases, consideration should be given to granting a reduction of royalty rate in conjunction with gas conservation measures, where a profitable/nonprofitable lease operation would be affected by royalty rate.

In cases where the only gas conservation option considered is reinjection, payout of the gas operation must be calculated solely from oil revenue, and the limiting factor for a gas-only payout ignored. However, estimated enhanced recovery resulting from gas injection should be considered in an economic evaluation. While neither the operator nor the Supervisor can place a true value on gas which is reinjected because of the lack of, or unfavorable, marketing conditions, the gas will have an intangible future value, which should not be completely ignored.

A tabular example, which illustrates an evaluation of a new field/lease, follows, in which the capital investment required for initial oil production has been established, and the gas gathering facilities are considered for the following year. The example assumes a 12% discount factor for both oil and gas. It shows a payout of the oil operation in 3.4 years, the gas operation in 4 years, and the combined in 3.6 years. Because the combined payout is less than oil payout period plus 25% ($3.4 + .85 = 4.25$) and the gas operation will pay out in less than 5 years, conservation of gas is required.

If the example were an old field (payout of the original capital investment had been achieved), the development cost for oil operation would not be considered (eliminate line 1 in the example and adjust PV factor of oil operations to start at year 1), and the payout of gas facilities would be based on total lease net income. In this case, the payout would be $\$110,000 \div \$360,000/\text{yr.}$ or 0.3 year or 3.7 months, and conservation of gas would be required.

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Oil Operation Only

Yr	Cost(\$)	Net Income(\$)	PV Factor	Present Value(\$)	Cumulative Present Value(\$)
0	1,000,000	0	1.0000	0	0
1		360,000	.94491	340,167	340,167
2		360,000	.84367	303,721	643,888
3		350,000	.75328	263,648	907,536
4		340,000	.67258	228,677	1,136,214 ¹

¹Payout in 3.4 years.

Gas Operation Only

Yr	Cost(\$)	Net Income(\$)	PV Factor	Present Value(\$)	Cumulative Present Value(\$)
0	0	0	---	0	0
1	110,000	0	1.00000	0	0
2	0	20,000	.94491	18,898	18,898
3		40,000	.84367	33,746	52,645
4		40,000	.75328	30,131	82,776
5		40,000	.67257	26,902	1,109,679 ²
6		40,000	.60051	24,020	133,699 ²

²Payout in 4.0 years.

Combined Operations

Yr	Cost(\$)	Net Income(\$)	Present Value(\$)	Cumulative Present Value(\$)
0	1,000,000	0	0	0
1	110,000	360,000	340,167	340,167
2		380,000	322,619	662,787
3		390,000	297,394	960,181 ³
4		380,000	258,808	1,218,990 ³

³Payout in 3.6 years.

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12%

PRESENT WORTH DISCOUNT FACTORS AT 12%
FOR INCOME RECEIVED IN ONE PAYMENT AT MIDDLE OF YEAR

Year	Factor for Year	Equal Payments	5% Per Yr. Decline	10% Per Yr. Decline	15% Per Yr. Decline	20% Per Yr. Decline	30% Per Yr. Decline	40% Per Yr. Decline	50% Per Yr. Decline
1	.94491	.94491	.94491	.94491	.94491	.94491	.94491	.94491	.94491
2	.84367	.84429	.89559	.89696	.89840	.89992	.90322	.90695	.91116
3	.75328	.84729	.85056	.85401	.85764	.86145	.86967	.87872	.88861
4	.67257	.80361	.80943	.81555	.82197	.82869	.84298	.85826	.87421
5	.60051	.76299	.77182	.78110	.79080	.80089	.82199	.84377	.86538
6	.53617	.72518	.73740	.75023	.76359	.77738	.80566	.83373	.86015
7	.47872	.68998	.70588	.72257	.73987	.75756	.79308	.82692	.85715
8	.42743	.65716	.67700	.69779	.71922	.74093	.78350	.82237	.85546
9	.38163	.62654	.65050	.67557	.70126	.72700	.77625	.81938	.85454
10	.34074	.59796	.62617	.65565	.68567	.71538	.77083	.81744	.85403
11	.30424	.57126	.60362	.63780	.67214	.70573	.76679	.81619	.85377
12	.27164	.54629	.58327	.62178	.66042	.69772	.76382	.81540	.85362
13	.24254	.52293	.56435	.60742	.65028	.69110	.76163	.81490	.85355
14	.21655	.50104	.54693	.59454	.64151	.68564	.76003	.81459	.85351
15	.19335	.48053	.53086	.58298	.63394	.68115	.75888	.81439	.85349
16	.17263	.46129	.51604	.57261	.62741	.67747	.75804	.81427	.85348
17	.15414	.44322	.50235	.56330	.62178	.67446	.75743	.81420	.85347
18	.13762	.42624	.48970	.55495	.61694	.67199	.75700	.81415	.85347
19	.12288	.41027	.47800	.54745	.61277	.66999	.75669	.81412	.85347
20	.10971	.39525	.46717	.54072	.60919	.66835	.75647	.81410	.85347
21	.09796	.38109	.45714	.53468	.60612	.66703	.75631	.81409	.85347
22	.08746	.36774	.44783	.52925	.60348	.66595	.75620	.81409	.85347
23	.07809	.35515	.43920	.52437	.60122	.66508	.75612	.81408	.85347
24	.06972	.34326	.43118	.52000	.59929	.66437	.75606	.81408	.85347
25	.06225	.33202	.42372	.51606	.59763	.66380	.75602	.81408	.85347
26	.05558	.32138	.41679	.51253	.59621	.66334	.75600	.81408	.85347
27	.04963	.31132	.41034	.50935	.59500	.66297	.75598	.81408	.85347
28	.04431	.30178	.40432	.50650	.59396	.66267	.75596	.81408	.85347
29	.03956	.29274	.39872	.50393	.59307	.66242	.75595	.81408	.85347
30	.03532	.28416	.39349	.50163	.59231	.66223	.75595	.81408	.85347
31	.03154	.27601	.38861	.49956	.59167	.66207	.75594	.81408	.85347
32	.02816	.26827	.38406	.49770	.59112	.66195	.75594	.81408	.85347
33	.02514	.26090	.37980	.49602	.59065	.66185	.75593	.81408	.85347
34	.02245	.25389	.37581	.49452	.59025	.66177	.75593	.81408	.85347
35	.02004	.24720	.37208	.49316	.58990	.66170	.75593	.81408	.85347
36	.01790	.24083	.36859	.49195	.58961	.66165	.75593	.81408	.85347
37	.01598	.23476	.36532	.49085	.58936	.66161	.75593	.81408	.85347
38	.01427	.22895	.36225	.48987	.58915	.66157	.75593	.81408	.85347
39	.01274	.22341	.35937	.48898	.58897	.66155	.75593	.81408	.85347
40	.01137	.21811	.35667	.48819	.58882	.66152	.75593	.81408	.85347
41	.01015	.21304	.35414	.48747	.58869	.66151	.75593	.81408	.85347
42	.00907	.20818	.35175	.48682	.58858	.66149	.75593	.81408	.85347
43	.00810	.20353	.34951	.48625	.58848	.66148	.75593	.81408	.85347
44	.00723	.19907	.34741	.48572	.58840	.66147	.75593	.81408	.85347
45	.00645	.19479	.34543	.48526	.58833	.66147	.75593	.81408	.85347
46	.00576	.19068	.34356	.48483	.58828	.66146	.75593	.81408	.85347
47	.00514	.18673	.34180	.48445	.58823	.66146	.75593	.81408	.85347
48	.00459	.18294	.34015	.48411	.58818	.66145	.75593	.81408	.85347
49	.00410	.17929	.33859	.48381	.58815	.66145	.75593	.81408	.85347
50	.00366	.17577	.33712	.48353	.58812	.66145	.75593	.81408	.85347

Exhibit 3
644.5.3K

		COMPENSATION DUE		
		None	Royalty	Full Value
DISPOSITION OF PRODUCTION	Oil Sales		X	
	Gas Sales		X	
	Gas Flared/Lost With Prior Approval	X		
	Oil or Gas Beneficially Used	X		
	Gas Flared/Lost Without Prior Approval			X
	Oil or Gas Avoidably Lost			X

